

Amendment of the Claims

The listing of the claims, below, will replace all prior versions and listings of claims in the application.

Listing of the Claims

1. (currently amended) A process for isolating nucleic acids comprising the following steps:
  - charging a non-siliceous surface from a given direction with nucleic acids, wherein said non-siliceous surface has two opposing sides;
  - immobilizing the nucleic acids on one side of the non-siliceous surface;
  - releasing the immobilized nucleic acids from the non-siliceous surface; and
  - removing the released nucleic acids from the same side of the non-siliceous surface on which the nucleic acids were immobilized,

wherein the nucleic acids do not penetrate to or make contact with the other opposing side of the non-siliceous surface.
2. (previously presented) The process according to claim 1, wherein the non-siliceous surface is oriented so that one of the two opposing sides of the non-siliceous surface is on top of the other side and so that the charging and removal of the nucleic acids takes place from the top opposing side of the non-siliceous surface.
3. (previously presented) The process according to claim 1, wherein, between the immobilization and release steps, a washing of the immobilized nucleic acids with at least one washing buffer takes place.
4. (previously presented) The process according to claim 3, wherein the washing includes the following steps for each washing buffer:
  - transferring a predetermined amount of washing buffer to the non-siliceous surface, and
  - drawing the washing buffer through the non-siliceous surface by suction.

5. (previously presented) The process according to claim 1 further comprising the following steps:

- mixing of the nucleic acids with an immobilization buffer;
- charging of the nucleic acids with the immobilization buffer on to the non-siliceous surface;
- drawing the fluid components through the surface.

6. (withdrawn) The process according to any of claims 1, 2 or 4, wherein at least one of the steps is carried out completely automatically by means of an automatic machine.

7. (withdrawn) The process according to claim 6, wherein all the steps in the process are carried out by an automatic machine in a controlled sequence.

8. (withdrawn) The process according to claim 6, wherein multiple isolations of nucleic acids are carried out simultaneously using a multiplicity of surfaces.

9. (previously presented) The process according to claim 1, characterized by the fact that between the release and the removal steps at least one chemical reaction is carried out on the nucleic acids.

10. (original) The process according to claim 5, wherein said immobilization buffer includes aqueous solutions of salts of alkaline and alkaline earth metals with mineral acids.

11. (original) The process according to claim 10, wherein said immobilization buffer includes alkaline or alkaline earth halogenides or sulfates.

12. (original) The process according to claim 11, wherein said immobilization buffer includes halogenides of sodium or potassium or magnesium sulfate.

13. (previously presented) The process according to claim 5, wherein said immobilization buffer includes aqueous solutions of salts of monobasic or polybasic or polyfunctional organic acids with alkaline or alkaline earth metals.
14. (previously presented) The process according to claim 13, wherein said aqueous solutions of salts of polyfunctional organic acids with alkaline or alkaline earth metals includes aqueous solutions of salts of sodium, potassium, or magnesium with organic dicarboxylic acids.
15. (original) The process according to claim 14, wherein said organic dicarboxylic acid is oxalic acid, malonic acid, or succinic acid.
16. (previously presented) The process according to claim 13, wherein said aqueous solutions of salts of polyfunctional organic acids with alkaline or alkaline earth metals includes aqueous solutions of salts of sodium or potassium in combination with hydroxycarboxylic or polyhydroxycarboxylic acid.
17. (original) The process according to claim 16, wherein said polyhydroxycarboxylic acid is citric acid.
18. (original) The process according to claim 5, wherein said immobilization buffer includes hydroxyl derivatives of aliphatic or acyclic saturated or unsaturated hydrocarbons.
19. (original) The process according to claim 18, wherein said hydroxyl derivatives are C1-C5 alkanols.
20. (original) The process according to claim 19, wherein said alkanols are selected from methanol, ethanol, n-propanol, tert.-butanol and pentanols.
21. (original) The process according to claim 18, wherein said hydroxyl derivative is an aldite.

22. (original) The process according to claim 5, wherein said immobilization buffer includes a phenol or polyphenol.

23. (cancelled)

24. (original) The process according to claim 1, wherein the releasing step is carried out using an aqueous salt or buffer solution.

25. (previously presented) The process according to claim 1, wherein the nucleic acids immobilized on the surface are released using water.

26. (previously presented) The process according to claim 5, wherein said immobilization buffer comprises an aqueous solution of a chaotropic agent.

27. (previously presented) The process according to claim 26, wherein the chaotropic agent is selected from the group consisting of trichloro-acetates, thiocyanates, perchlorates, iodides, guanidinium hydrochloride, guanidinium isothiocyanate, and urea.

28. (previously presented) The process according to claim 26, wherein said immobilization buffer comprises a 0.01-molar to 10-molar aqueous solution of the chaotropic agent.

29. (previously presented) The process according to claim 28, wherein said immobilization buffer comprises a 0.1-molar to 7-molar aqueous solution of the chaotropic agent.

30. (previously presented) The process according to claim 29, wherein said immobilization buffer comprises a 0.2- molar to 5-molar aqueous solution of the chaotropic agent.

31. (previously presented) The process according to any one of claims 26 through 30, wherein said immobilization buffer comprises an aqueous solution of sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide, or potassium iodide.

32. (original) The process according to claim 1, wherein the surface is a membrane.
33. (original) The process according to claim 32, wherein the membrane is a hydrophobic membrane.
34. (original) The process according to claim 33, wherein the hydrophobic membrane is made of a polymer with polar groups.
35. (original) The process according to claim 32, wherein the membrane is a hydrophilic membrane with a hydrophobized surface.
36. (original) The process according to claim 32, wherein the membrane is composed of a polymeric material selected from the group consisting of nylon, a polysulfone, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorotrifluoroethylene copolymerisate, and polyphenylene sulfide.
37. (original) The process according to claim 36, wherein the membrane consists of hydrophobized nylon.
38. (previously presented) The process according to claim 36, wherein the membrane is coated with a hydrophobic coating agent selected from the group consisting of paraffins, waxes, metallic soaps, quaternary organic compounds, urea derivatives, lipid-modified melamine resins, organic zinc compounds, and glutaric dialdehyde.
39. (original) The process according to claim 32, wherein the membrane is a hydrophilic or hydrophilized membrane.

40. (original) The process according to claim 39, wherein the membrane is composed of hydrophilized nylon, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorotrifluoroethylene copolymerisate, or polyphenylene sulfide.

41. (currently amended) The process according to any one of claims 32 through 40, wherein the membrane has pores which have a range of diameters ~~selected from the group consisting of 0.001 to 50 micrometers, 0.01 to 20 micrometers, and from 0.05 to 10 micrometers.~~

42. (cancelled)

43. (cancelled)

44. (previously presented) The process according to claim 1, wherein a chaotropic agent is used for the immobilization of the nucleic acids.

45. (previously presented) The process according to claim 44, wherein the chaotropic agent is selected from the group consisting of trichloro-acetates, thiocyanates, perchlorates, iodides, guanidinium hydrochloride, guanidinium isothiocyanate, and urea.

46. (previously presented) The process according to claim 44, wherein a 0.01-molar to 10-molar aqueous solution of the chaotropic agent is used for the immobilization of nucleic acids.

47. (previously presented) The process according to claim 46, wherein a 0.1-molar to 7-molar aqueous solution of the chaotropic agent is used for the immobilization of nucleic acids.

48. (previously presented) The process according to claim 47, wherein a 0.2-molar to 5-molar aqueous solution of the chaotropic agent is used for the immobilization of nucleic acids.

49. (previously presented) The process according to any one of claims 44 through 48, wherein the chaotropic agent is selected from the group consisting of sodium perchlorate, guanidinium hydrochloride, guanidinium isothiocyanate, sodium iodide, and potassium iodide.

50. (original) The process according to claim 5, wherein said immobilization buffer has a pH of from 3 to 11.

51. (currently amended) A process for isolating nucleic acids comprising ~~immobilization of~~ immobilizing nucleic acids on one side of a membrane, followed by ~~release of~~ releasing the nucleic acids and ~~collection of~~ collecting the nucleic acids from the same side of the membrane on which the nucleic acids were immobilized; wherein the nucleic acids do not penetrate or contact the other side of the membrane; wherein the membrane comprises a material selected from the group consisting of nylon, polysulfone, polyether sulfone, polycarbonate, polyacrylate, acrylic acid copolymer, polyurethane, polyamide, polyvinyl chloride, polyfluorocarbonate, polytetrafluoroethylene, polyvinylidene fluoride, polyvinylidene difluoride, polyethylene tetrafluoroethylene copolymerisate, polyethylene chlorodifluoroethylene copolymerisate, and polyphenylene sulfide; and wherein the membrane material is hydrophilic, hydrophobic, hydrophilisized, or hydrophobisized.

52. (canceled)

53. (currently amended) The process according to claim ~~51~~ 52, wherein the membrane is a hydrophobisized nylon membrane.

54. (previously presented) The process according to claim 51, wherein the membrane is a hydrophilic membrane, which is coated with a hydrophobic coating agent selected from the group consisting of paraffins, waxes, metallic soaps, quaternary organic compounds, urea derivates, lipid-modified melamine resins, organic zinc compounds, and glutaric dialdehyde.

55. (previously presented) The process according to claim 51, wherein said process for isolating nucleic acids is carried out in a plurality of isolation devices installed on a multi-well plate.

56. (withdrawn) An apparatus adapted to the automatic performance of a process according to any one of claims 1 through 49.

57. (withdrawn) The apparatus of claim 56, comprising at least one vacuum apparatus suitable for automatically carrying out the application of buffers and solutions to a surface in an isolation device and automatically removing buffers and solutions away from the surface.

58. (currently amended) The process according to one of claims 51, and 53 through 55, wherein the step of immobilizing the ~~immobilization of~~ nucleic acids takes place at a pH of from 3 to 11.

59. (previously presented) The process according to claim 3, wherein the washing step is carried out using a an aqueous solution of a salt of an alkaline or alkaline earth metal with a mineral acid.

60. (previously presented) The process according to claim 3, wherein the washing step is carried out using a an aqueous solution of a salt from a monobasic, polybasic, or polyfunctional organic acid with an alkaline or alkaline earth metal.

61. (previously presented) The process according to claim 3, wherein the washing step is carried out using an aqueous solution of a chaotropic agent.

62. (previously presented) The process according to claim 3, wherein the washing step is carried out using a hydroxyl derivative of an aliphatic or acyclic saturated or unsaturated hydrocarbon.

63. (previously presented) The process according to claim 3, wherein the washing step is carried out using a phenol or a polyphenol.



64. (previously presented) The process according to claim 38 or claim 54, wherein said metallic soaps are in admixture with aluminum or zirconium salts.

65. (not entered)

66. (not entered)

67. (new) The process according to claim 41, wherein the membrane that has pores that range from 0.01 to 20 micrometers in diameter.

68. (new) The process according to claim 41, wherein the membrane has pores that range from 0.05 to 10 micrometers in diameters

69. (new) The process according to claim 51, further comprising the steps of:

- mixing the nucleic acids with an immobilization buffer,
- charging the nucleic acids with the immobilization buffer onto the membrane,
- optionally, washing the nucleic acids immobilized on the membrane,
- drawing the unbound fluid components of the immobilization buffer or wash buffer through the membrane.

70. (new) The process according to claim 69, wherein said immobilization buffer includes aqueous solutions of salts of alkaline and alkaline earth metals with mineral acids.

71. (new) The process according to claim 69, wherein said immobilization buffer includes aqueous solutions of salts of monobasic or polybasic or polyfunctional organic acids with alkaline or alkaline earth metals.

72. (new) The process according to claim 69, wherein said immobilization buffer includes hydroxyl derivates of aliphatic or acyclic saturated or unsaturated hydrocarbons.

73. (new) The process according to claim 69, wherein said immobilization buffer includes a phenol or polyphenol.

74. (new) The process according to claim 51 or claim 69, wherein a chaotropic agent is used for the immobilization of the nucleic acids.

75. (new) The process according to claim 51 or claim 69, wherein the immobilization of nucleic acids takes place at a pH of from 3 to 11.